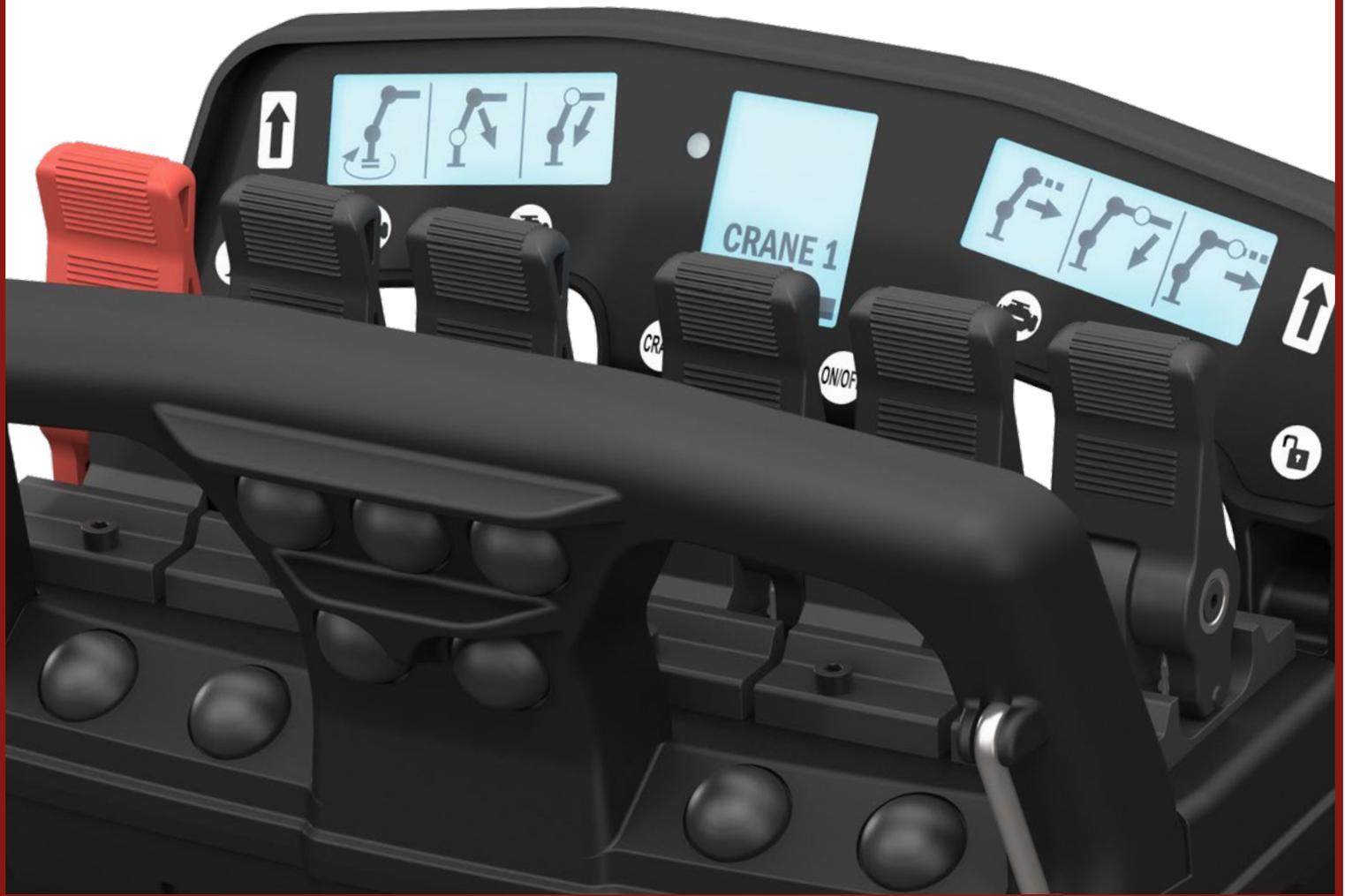


Olsbergs

means total control



MultiDrive 3

Controller Display 6F

2017

 English

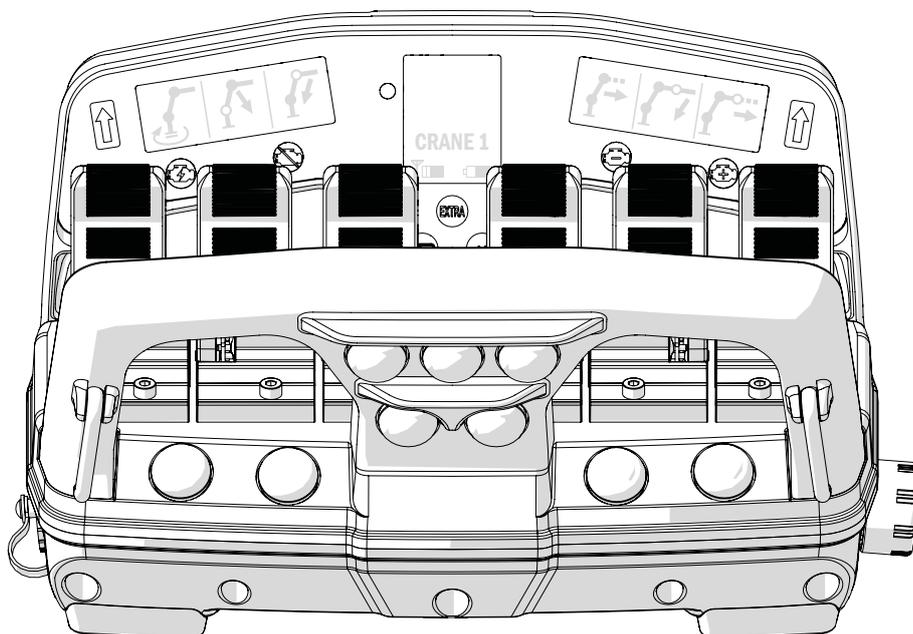
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Introduction

Safety philosophy

The control system fulfils stringent safety requirements in terms of reliability and operational safety.

The products are CE-marked and approved in accordance with machinery directive 2006/42/EG.

The radio conforms with the R&TTE Directive (2014/53/EU, RED) and Harmonized European Standard ETSI EN 300 220-2 V3.1.1



Olsbergs radio remote control system has been developed to provide operators with continual feedback via its displays on the hand controller. The hand controller's standard menu selection system utilises the displays to provide the operator with real time information about the chosen menu, battery status, reception conditions etc.

The hand controller contains a two-way communication radio enabling information to be sent both to it and from it. The radio decoder contains a corresponding unit to handle traffic at the other end.

The hand controller utilises 868 Mhz radio with max. e.r.p of 25 mW, which is operating in the ISM 863–870 Mhz frequency band, a free band approved by the European Commission.

- This means that no license is needed and the radio can in principle be used everywhere in EU including over national boundaries. For detailed information about free band use see www.efis.dk

The side displays show the symbol for the function each lever activates in the chosen menu. When the operator changes menu, the symbols change to the functions that become active.

The centre display provides information about which menu has been chosen, as well as indicating the radio reception conditions, battery status, fault information, micro, manual extension and so on.

Radio Decoder

The radio decoder contains one of the radio units. The decoder translates the radio traffic, consisting of lever and button data from the hand controller, to the CAN bus.

For safety reasons, it is extremely important that data is not corrupted, therefore the decoder has dual micro-processors which monitor each other to ensure accuracy in the translation. The controller and the decoder must be "paired" with each other to establish a connection. A unique code is loaded and stored in each unit. The pairing procedure is described elsewhere in this documentation.



- LED L1: Fault status
- LED L2: Radio communication status
- LED L3: Radio control on
- Connector controller cable

Blink mode for each LED in different operating cases:

Decoder on, under initialisation:



Cable operation:



Decoder powered, no radio connection:



Radio connection present, safety requirements not met:



Normal operation:



Pairing procedure in progress:



Pairing procedure complete:



Internal error or failed pairing procedure:



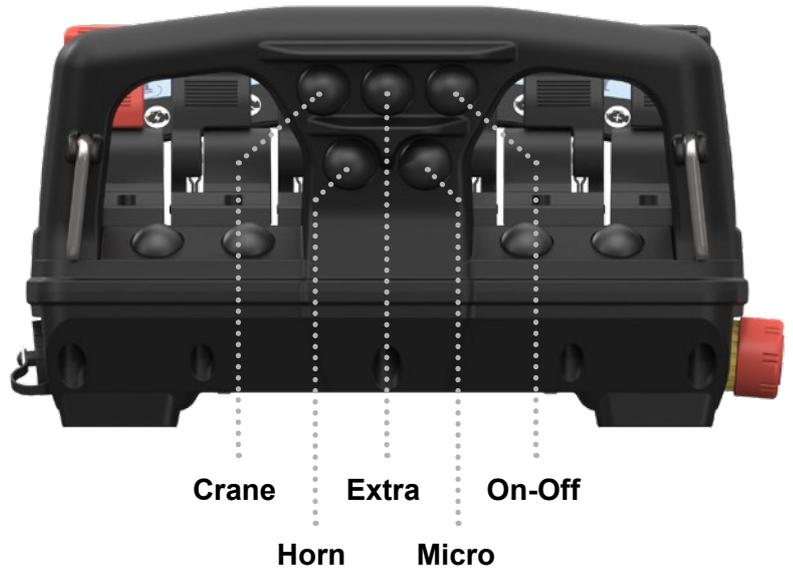
Controller

The hand controller is the device that the operator uses to control his crane and his vehicle.

The hand controller has six levers. The functions of each lever may be the same or different in different menus, however only one function can exist per lever at any one time. If a lever is faulty, or if it is deflected on starting, it is disabled. The other levers operate as usual.

Activating the micro-button enables the operator to set the levers to two preset values e.g. 50% or 20% of normal speed thus enabling the crane to be operated with increased precision.

Buttons for main menu



Battery
1700 mAh

"Twilight relay"

Side display, left

Centre display

Side display, right

Info button
showing error
codes in the
centre display

Lever 1-6
display symbol
shows direction
of operation with
lever forward

Release button

Stop button

Cable connector

Configurable buttons
for on/off functions e.g.
start/stop engine, rpm up/
down etc.

Getting started

Installing the battery

Install a fully-charged battery in the hand controller as shown on the right. **(1)**

The battery must be installed correctly **(2)** or the hand controller will not start.

A fully-charged 1700 mAh battery provides approximately 8 hours of operation.

Activating the controller

To activate the hand controller pull the stop button out by turning it clockwise **(2)**. The hand controller is powered up and starts to establish a radio link with the decoder on the crane. While radio contact is being established a flashing hourglass and the text "Wait" is shown on the centre display. **(6)**

Remaining battery power is displayed and the signal strength symbol flashes when radio communication is established but the hand controller and decoder are still exchanging connection data.



Connection time for a cold-start can be up to 5 seconds. A cold-start occurs when the hand controller or decoder on the crane have been off for the last 10 minutes. When restarting within 10 minutes of turning off the hand controller, the radio link is still established and the hand controller is ready for use immediately.

The factory setting for the period of time the hand controller maintains contact with the decoder after pressing the stop button is 10 minutes.

Getting started

Radio link established

When the radio connection is established the yellow LED on the decoder shines steadily and the green LED blinks rapidly. **(3)**

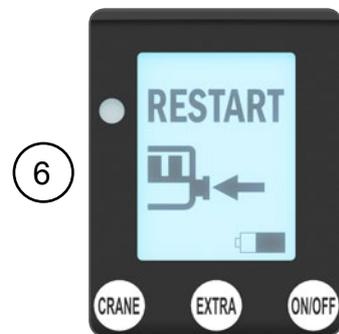
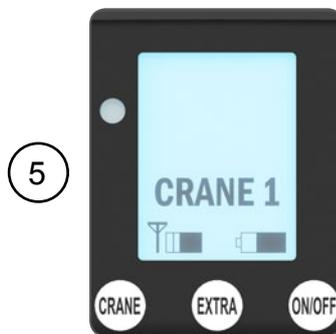
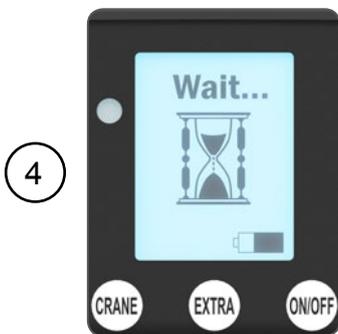
The hourglass symbol on the hand controller disappears and the text "Wait" **(4)** is replaced by "CRANE 1". **(5)**

The radio signal strength is now shown without blinking.

If the radio connection is disrupted for longer than 0.5 of a second, then "CRANE 1" is replaced by the "RESTART" symbol **(6)** and the signal strength symbol will either disappears or start blinking.

To restart the controller press in the stop button and pull it out again by turning it clockwise. **(2)**

If the hand controller has been turned off it will always restart in "CRANE 1". **(7)**



Menu system

Olsbergs hand controllers are equipped with a menu selection system as standard.

There are three main menus which can be easily accessed via three push buttons.

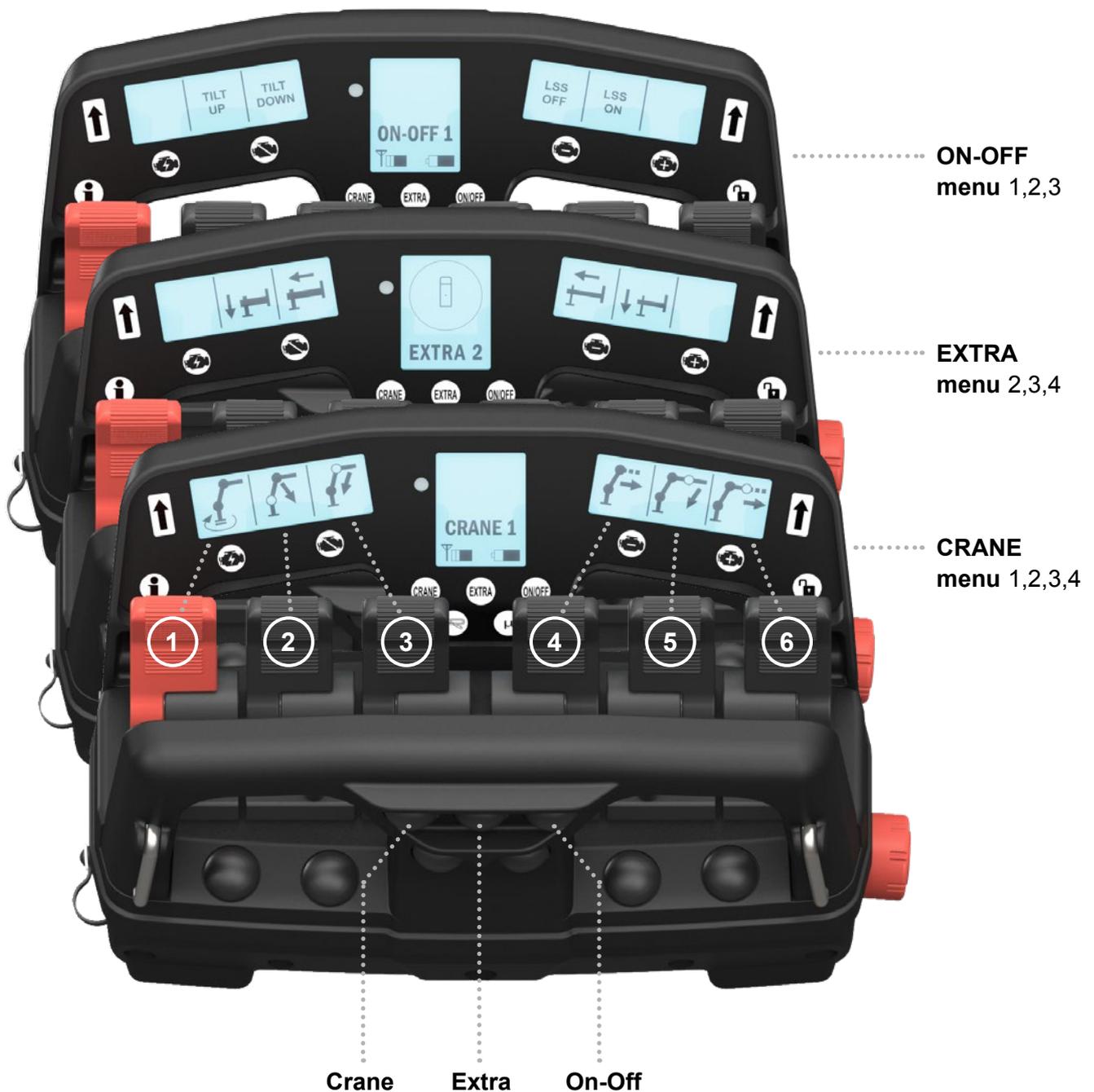
The main menus are:

- the CRANE menu
- the EXTRA menu
- the ON-OFF menu

In each of the main menus the operator can select sub-menus by repeatedly pressing the same button, e.g. 1-2-3 and then back to 1 again.

The sum of Crane and Extra menus may not exceed 4. For a 6-lever hand controller, the maximum number of On-Off menus are 3 with on/off functions on lever 2,3,4 and 5.

The system with main menus enables the operator to change quickly from crane operation to outrigger operation and back again. The hand controller always restarts in menu CRANE 1.



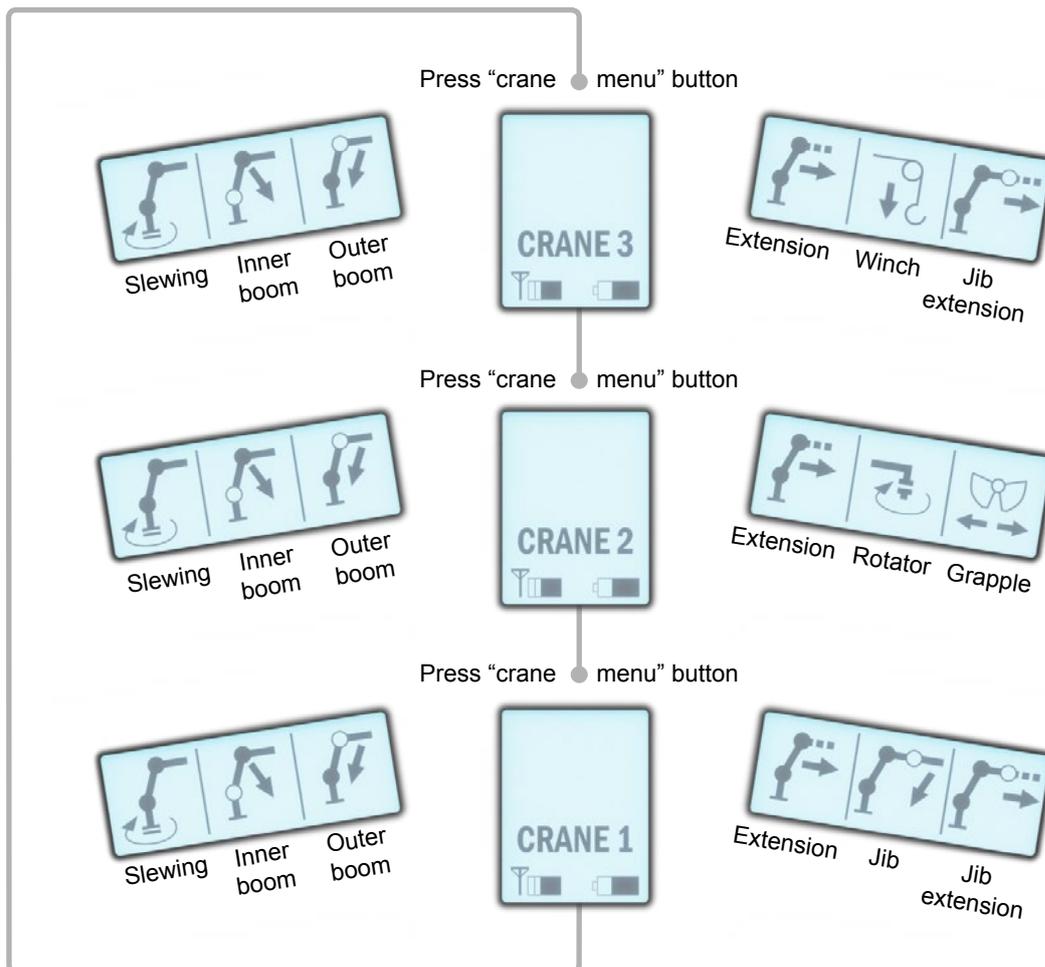
Main menu "CRANE", proportional functions

The sub-menus in "CRANE" mode are configured when the crane is fitted to the vehicle. The right and left side displays show symbols representing the functions controlled by the corresponding levers.

When the crane menu changes, the symbols and texts change to match the functions available via the current menu.

The symbols are stored in a symbol library. If the library does not contain the required symbol, a description of the function can be written instead. Only Arabic numerals and letters from the English alphabet can be used in the descriptions.

Symbols and texts can be configured via the safety system.



"Crane menu" button

The left-hand button in the top row on the bar, facing towards the operator. When the operator pulls out the start button on the hand controller, it always starts in menu CRANE 1.



Main menu "EXTRA", proportional functions

The "EXTRA" main menu contains additional hydraulic proportional functions that do not belong to the crane itself, such as outriggers front and rear, boat supports, levelling etc.

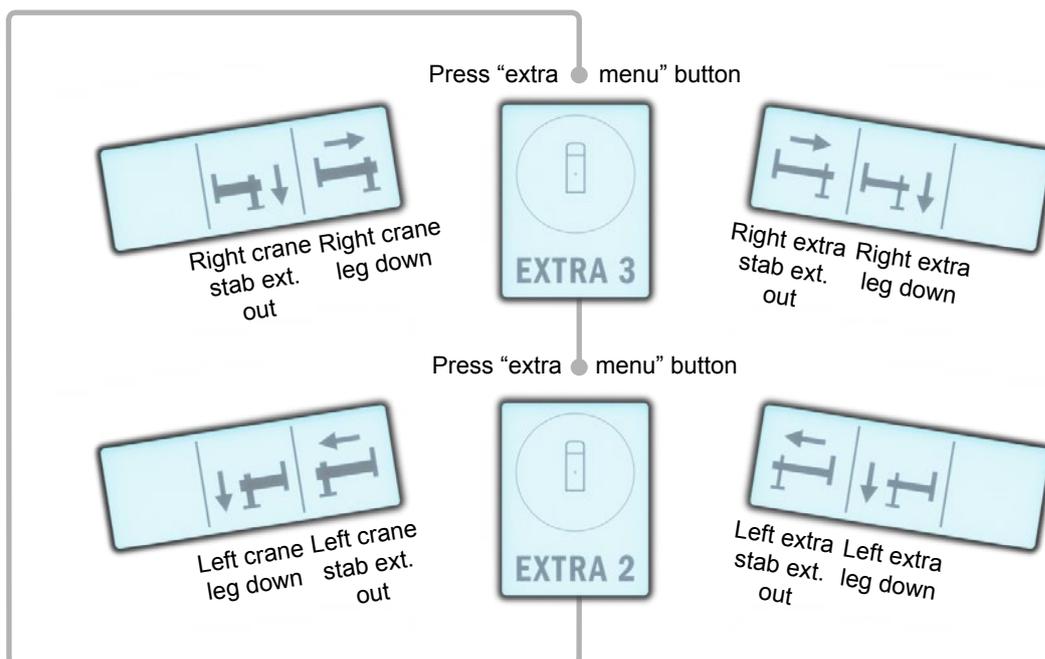
The symbols are stored in a symbol library. If the library does not contain the required symbol, a description of the function can be written instead. Only Arabic numerals and letters from the English alphabet can be used in the descriptions.

The symbols and descriptions are configured in the same way as the "CRANE" main menu and the same method is used for stepping between the sub-menus.

Cranes with 1 stabiliser valve



Cranes with 2 stabiliser valves



"Extra menu" button

The centre button in the top row on the bar facing the operator activates the EXTRA menu.

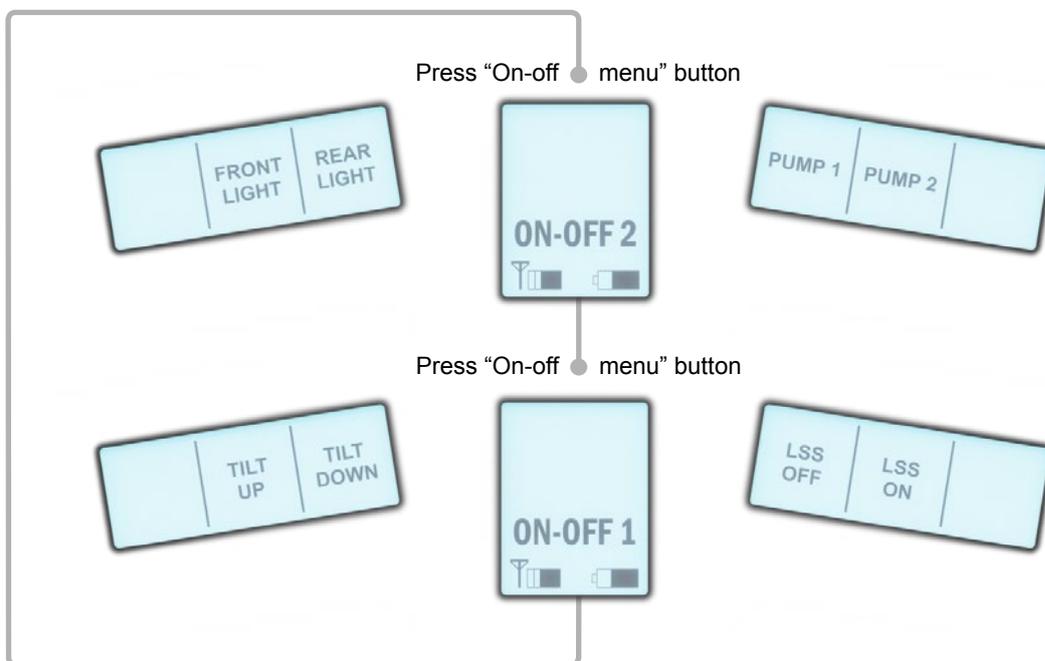
Main menu "ON-OFF", on-off functions

The "ON-OFF" main menu contains functions such as start, stop and throttle. The functions are configured at the bodybuilder.

No symbols are used for these functions at present, instead, a description matching the respective function and lever is shown in the display. Only Arabic numerals and letters from the English alphabet can be used in the descriptions.

The hand controller is prepared for the use of symbols for the ON-OFF functions.

The ON-OFF functions are controlled by the 4 levers located in the middle of the controller. Thus function 1 is controlled by lever 2, function 2 by lever 3 and so on. The ON-OFF functions are activated irrespective of which direction the lever is moved.



"On-off menu" button

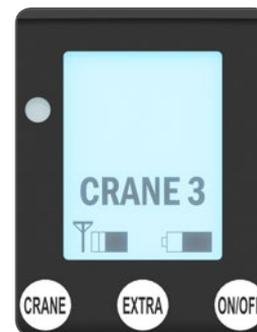
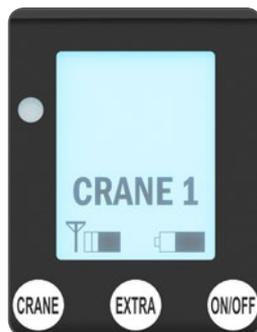
The right-hand button in the top row on the bar facing the operator enables the ON-OFF functions.

Centre display, view modes

The centre display is the system's information centre. It shows information that is not related to subsystems.

The symbols used for this information are described in detail below.

The images to the right shows examples of the appearance of the centre display during normal radio controlled operation of the crane.



Fault

A symbol of a spanner is shown when the safety system discovers a fault in the system.

Micro

Indicates that micro operation has been selected. Micro operation changes the sensitivity of the levers as follows: At full lever deflection, $\mu 50\%$ yields 50% of normal speed and $\mu 20\%$ yields 20% of normal speed for the crane. The micro values can be set at any value by Hiab.

Service

Indicates that the crane requires indata from from customer system.

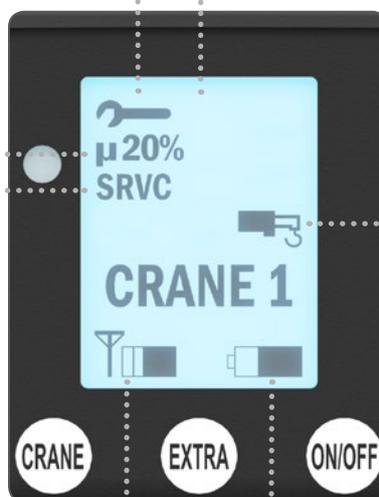
Signal strength

The number of bars shows the signal strength. Optimum reception is when all the bars are filled. When the symbol flashes the radio is connected but the start criteria have not been met.

Main menu

The text shows which main menu has been selected while the number shows which sub-menu of that main menu applies.

The main menus are: CRANE, EXTRA and ON-OFF. NOTE! The first menu number in EXTRA is one higher than the highest in CRANE. ON-OFF is numbered from 1.



Manual extension

Manual extension is selected by pressing the horn and release buttons at the same time. The customer system acknowledges by showing this symbol.

Battery capacity

The battery symbol shows the battery power remaining. When the system starts to blink there is only a few minutes of operation left. Information is sent to the safety system which can then emit a warning signal. If the system is run until the battery power fails the hand controller will automatically lock.

Centre display, view modes

Indication of micro / SRVC / Manual extension

When one of the above functions is selected the symbol is enlarged **(1)** for 3 seconds before returning to its normal size **(2)** so as to alert the operator that a change has occurred.

Fault indication

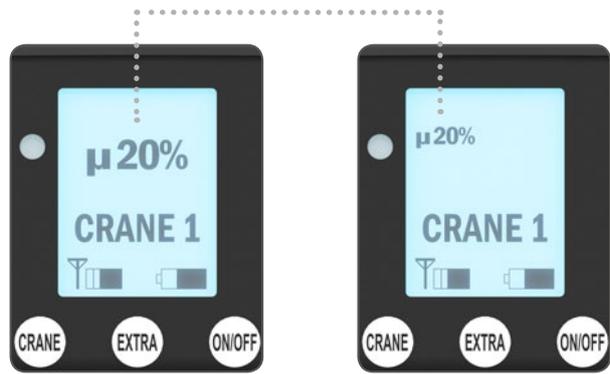
An enlarged image of the fault symbol **(3)** appears and the crane stops when a critical fault is detected. To continue, the fault must first be confirmed by pressing the release button, only then will the spanner go back to normal size. **(4)**

When a non-critical fault is detected by the safety system an enlarged image of the spanner is shown **(3)** for 3 seconds before returning to normal size. **(4)**

Error code display

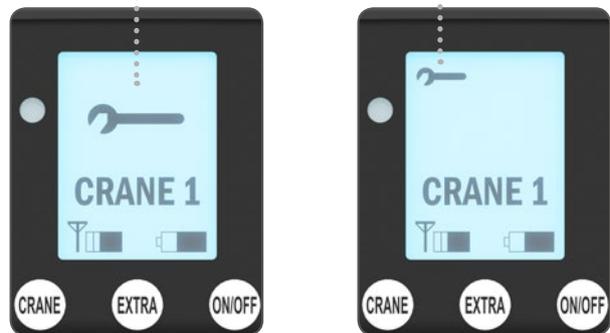
The customer system sends error codes to the hand controller. By pressing the info-button on the left hand side under the display handle **(6)** the centre display changes window to show the error codes. **(5)**

Error codes scroll up on the display at the same rate as the safety system sends them, once every half second. If there are more than 6 error codes at the same time the 6 most recent are shown.



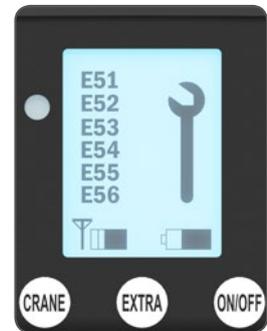
1

2



3

4



5

6



Info button for changing the centre display window.

Other instructions

Locking/unlocking the hand controller

The hand controller can be locked to prevent unauthorised persons, such as children, from starting the hand controller and operating the crane.

Locking the hand controller

1. Press the EXTRA button and the ON-OFF button when the stop button is pressed in.
2. Continue to hold the buttons pressed at the same time as the stop button is pulled out. The centre display will now show a locked padlock. **(1)**

Note!

If battery power drops too low the hand controller will lock automatically.

Unlocking the hand controller

1. Press the EXTRA button and the ON-OFF button when the stop button is pressed in.
2. Continue to hold the buttons pressed at the same time as the stop button is pulled out. The hand controller is ready for use. **(2)**

Low ambient temperature

The LCD-type displays on the hand controller are somewhat slow in changing state in low temperatures. At 0°C, it will take approximately 1 second, and at -20°C it can take up to 8 seconds before the symbols have been completely updated.

For safety reasons, quick shifts within a menu are not possible at temperatures below -10°C; though shifting between different menus will still be possible as normal.

To avoid the inconvenience that may be caused by the above, the hand controller should be stored at a temperature above +10°C when not in use.

No signal from the safety system

If a fault develops in communication with the safety system during operation, the system stops the crane. The centre display shows the spanner symbol to indicate that there is a fault. The crane can only be operated manually under emergency conditions if this occurs.



Replacing a hand controller or decoder

Every system has a unique controller/decoder pair which only communicates with each other. If one unit has to be replaced, a special procedure must be followed to make the new pair communicate. The procedure is as follows:

1. Switch off the system.
2. Unscrew the protection cap on the decoder and remove it.
3. Connect the hand controller with the accompanying cable (E0781) to the decoder.
4. Switch on the system and select "remote".
5. Hold down the release button on the hand controller while pulling out the stop button.

When the yellow LED on the decoder starts to blink, let go of the release button. When the procedure is complete, the yellow LED goes out. If the procedure was successful, only the green LED remains lit, if not, the red LED is lit. The procedure can take up to half a minute.

Other instructions

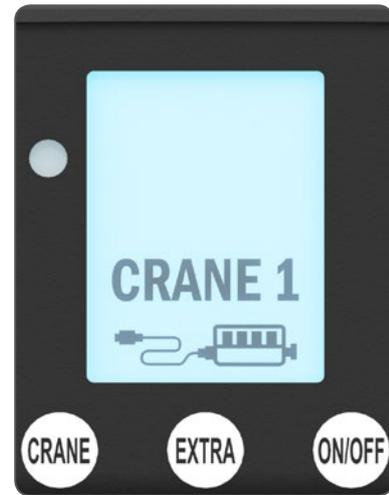
Cable control

The hand controller is normally used in radio mode but it is also possible to operate it via a cable.

A four-metre cable (E0781) is supplied as standard with the hand controller. The cable is intended to be used for short-term operation and when pairing in conjunction with the replacement of hand controllers or decoders. The cable connects to the vehicle via the decoder's CAN bus connector. **(3)**

When the cable is connected to the hand controller, the centre display shows that the controller is in cable operation mode. The symbols for signal strength (radio) and battery capacity are replaced with the symbol for cable operation. **(4)**

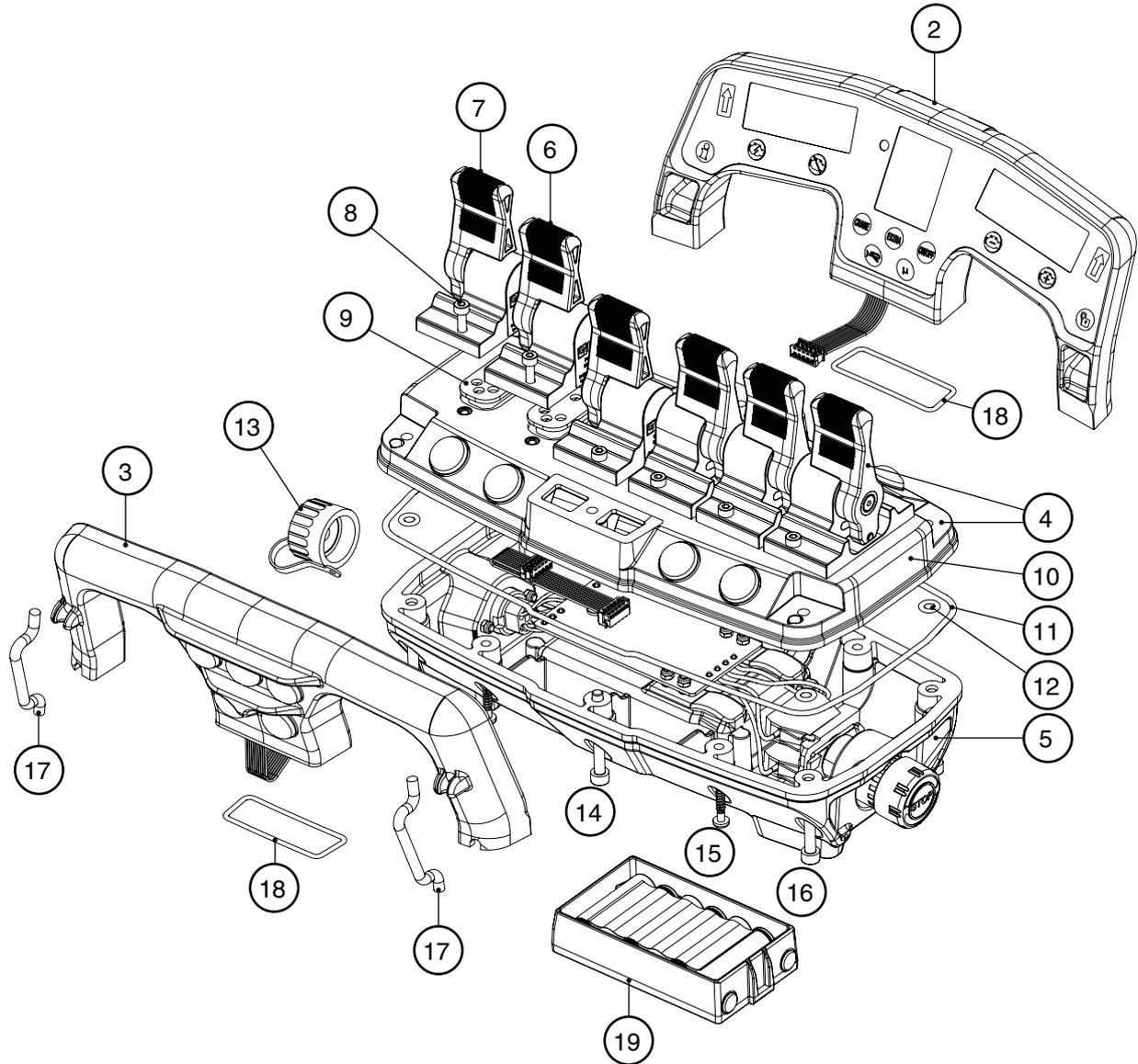
4



3

Controller display 6F MD3

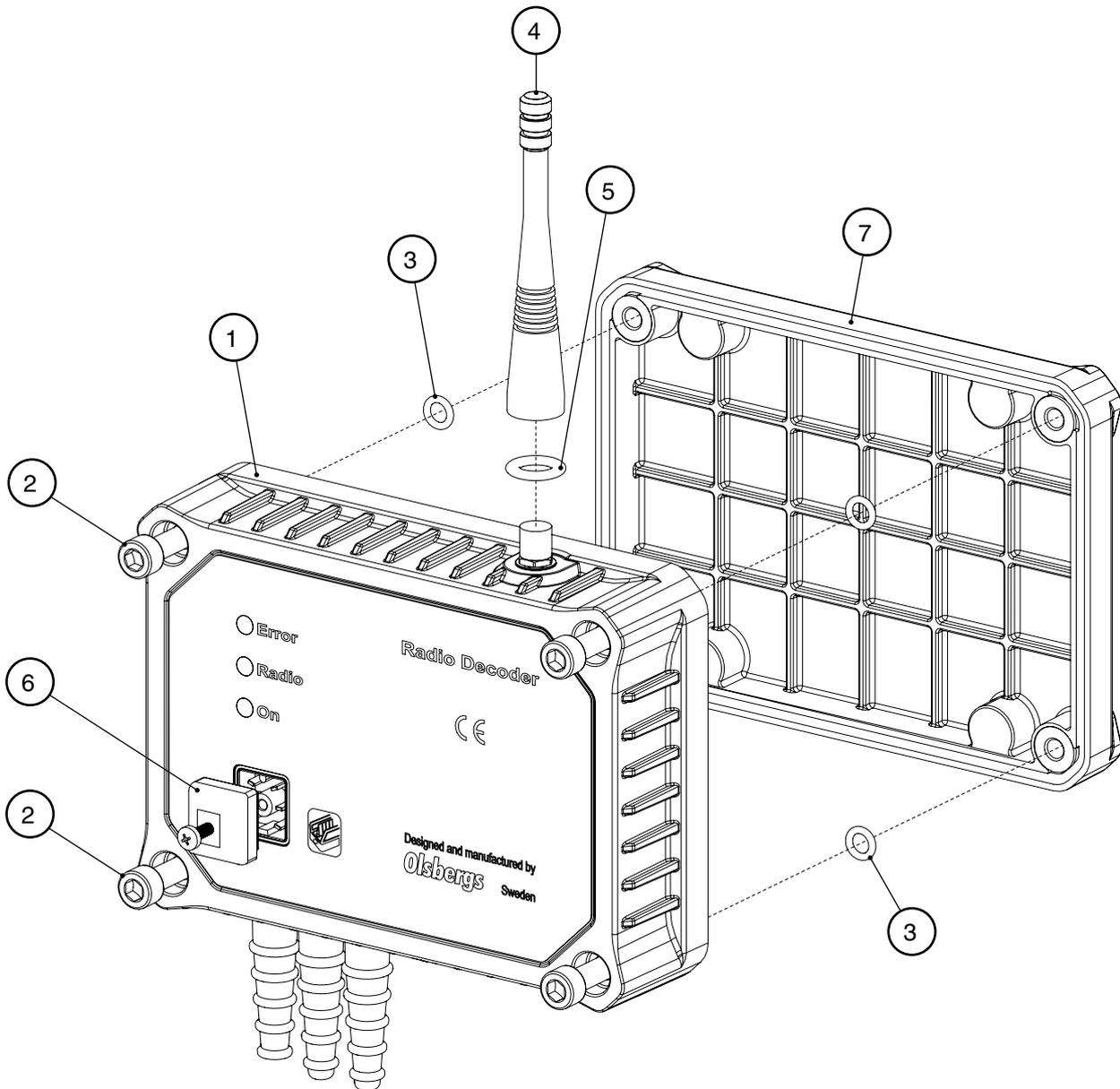
Spare parts



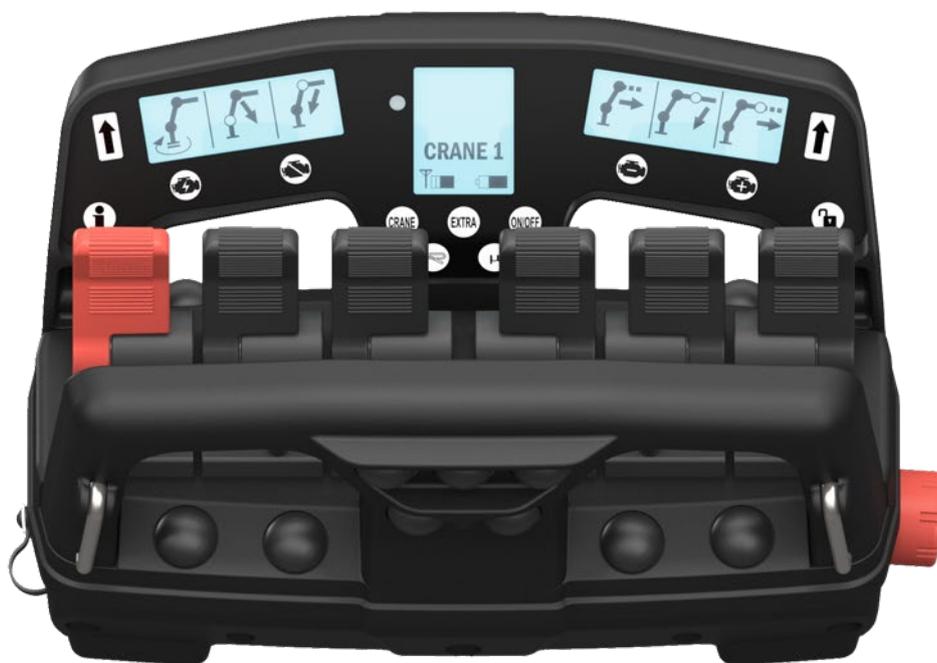
Pos.	Part no	Description	Notes
1	13190	Controller Display 6F MD3	Complete with all listed parts
2	E1750	Handle, Display 6F MD3	Complete incl. symbol labels
3	E17540	Handle, Push button 6F MD3	Complete
4	E17580	Controller 6f MD3, Top	Incl. levers
5	E1200	Controller MD2 6F, Bottom	Incl. stop button, contact chassis and cap
6	E04980	Lever, Black	Incl. screw and packing
7	E04990	Lever, Red	Incl. screw and packing
8	S2831	Screw M4x12 MC6S	A4 black nickel
9	E0447	Packing lever	
10	E17520	Top box, controller	Excl. levers
11	S2920	O-ring Ø224,0x2,62	NBR 70
12	S2939	O-ring Ø6,0x2,0	NBR 70 (4 pcs)
13	S2532	Cap, controller	
14	S0238	Screw M5x45 MC6S	A4 black nickel
15	S2938	Screw T40x25 TX	
16	S2912	Screw M5x40 MC6S	A4 black nickel
17	E1377	Fittings, carrier strap	
18	S2940	O-ring Ø45,0x2,0	NBR 70
19	12010	Battery NiMH, 7.2 V	

Decoder / Radio MD3

Spare parts



Pos.	Part no	Description	Notes
1	13200	Decoder / Radio MD3 G	Complete with all listed parts except E1432
2	S3152	Screw M6x40 MC6S	A4
3	S2556	O-ring Ø5,28x1,78	NBR 70
4	S3382	Aerial, MD3	
5	S2948	O-ring Ø8.0*3.0	EPDM
6	S2539	Protective cap	
7	E1432	Bottom box, low	Incl. o-ring



MultiDrive 3

Controller Display 6F

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EU Declaration of Conformity

We, **Olsbergs Electronics AB**
Of, **Fågelsångsvägen 10, SE 186 42 Vallentuna, Sweden**

declare under our sole responsibility that the product(s):

Product Name: MultiDrive 3
Model (s): Controller 6F, Decoder
Part Number(s): 13190, 13200

to which this declaration relates is(are) in conformity with the essential requirements and other relevant requirements of EU Directive 2014/53/EU (RED) Radio Equipment Directive.

<u>Type</u>	<u>Essential Requirements</u>
Health & Safety (article 3.1a)	EN 62368-1:2014 EN 62311:2008
EMC (article 3.1b)	EN 301 489-1 V2.1.1 (2017-02) in accordance with the specific requirements of EN 301 489-3 V2.1.1 (2017-03)
Spectrum (article 3.2)	EN 300 220-2 V3.1.1 (2017-02)

Vallentuna, Sweden, August 2017



Jan-Erik Steen
Managing Director, Olsbergs Electronics AB